



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/661,919	09/14/2000	Taku Uchino	03180.0265	9496

22852 7590 05/20/2004

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

FERRIS III, FRED O

ART UNIT	PAPER NUMBER
----------	--------------

2128

DATE MAILED: 05/20/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/661,919

Applicant(s)

UCHINO, TAKU

Examiner

Fred Ferris

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4,5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. *Claims 1-12 have been presented for examination based on applicant's disclosure filed 14 September 2000. Claims 1-12 have been rejected by the examiner.*

Drawings

2. *The formal drawing submitted on 12 September 2000 have been approved by the examiner.*

Priority

3. *Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119 based on Japanese Patent Application No. 11-264538 filed 17 September 1999.*

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. *Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. Specifically, independent claims 1 and 7 are drawn to a method for estimating power consumption and noise levels in integrated circuits by:*
 - *Calculating first stage output signal waveforms*
 - *Calculating second stage output signal waveforms*
 - *Calculating n^{th} stage output signal waveforms*

- *Where probabilities and correlations are calculated within predetermined time period*

However, no calculated result or practical application of the result has been recited in the limitations of the claims. The Examiner submits that Applicant's have not recited any limitations relating to a practical application of a calculated result in the technological arts. (see MPEP 2106)

*An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a **"useful, concrete and tangible result."** The test for practical application as applied by the examiner involves the determination of the following factors:*

(1) "Useful" - The Supreme Court in Diamond v. Diehr requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished.

(2) "Tangible" - Applying In re Warmerdam, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefore, is nonstatutory under 35 U.S.C. § 101. In Warmerdam the abstract idea of a data structure became capable of producing a useful result when it was fixed in a tangible medium which enabled its functionality to be realized.

(3) "Concrete" - Another consideration is whether the invention produces a "concrete" result. Usually, this question arises when a result cannot be assured. An appropriate rejection under 35 U.S.C. § 101 should be accompanied by a lack of enablement rejection, because the invention cannot operate as intended without undue experimentation.

The Examiner respectfully submits, under current PTO practice, and in view of the 112(1) rejections, that the claimed invention does not recite either a useful, concrete, or tangible result and is merely drawn to a mathematical algorithm.

- The claims are not concrete because the results are not assured. Is a solution possible for any and all arbitrary inputs?
- The output of the claimed limitations are not useful since the result does not specify how the calculations are actually used to estimate power consumption and noise levels in integrated circuits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. ***Claims 1, 4-7, 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,847,966 issued to Uchino et al. (of record)***

Art Unit: 2128

Independent claims 1 and 7 are drawn to:

Method and computer code for estimating IC power consumption and noise level by:
Calculating first stage output waveform and occurrence probabilities using input terminal values

Calculating second stage output waveform and occurrence probabilities using primary input terminal and first stage values

Calculating n^{th} stage output waveform and occurrence probabilities using primary input terminal and (n-1) stage values

And, calculated relating to signals located on each stage wiring inside IC within predetermined time period

Regarding independent claims 1 and 7: Uchino 966' teaches the elements of the claimed limitations of independent claims 1 and 7 as follows:

- Method and computer code for **estimating IC power consumption and noise level**: Uchino 966' teaches **estimating IC power consumption and noise level** of an integrated circuit design. (Abstract, Summary of Invention, CL3-L49, CL7-L25, Figs. 1-8, 10-14, waveforms: Figs. 12a-13b)
- Calculating first stage output waveform and occurrence probabilities using input terminal values: Uchino 966' teaches calculating output probability (occurrence of) for a first group of nodes (stage) using input node (terminal) values. (Abstract, CL4-L17-37, CL5-L15-23, Figs. 5, 10-14, waveforms: Figs. 12a-13b)
- Calculating second stage output waveform and occurrence probabilities using primary input terminal and first stage values: Uchino 966' teaches calculating output probability (occurrence of) for a second group of nodes (stage) using input node (terminal) values. (Abstract, CL36-L25-29, Fig. 5-S112)

- *Calculating n^{th} stage output waveform and occurrence probabilities using primary input terminal and (n-1) stage values: Uchino 966' teaches calculating the n^{th} stage output waveform (n^{th} group) probabilities (Abstract, CL5-L15-23, CL36-L25-29, CL7-L59-CL18-L45, Figs. 5-S112, 10-14)*
- *Calculations (probabilities) relating to signals located on each stage wiring inside IC within predetermined time period: Uchino 966' discloses probability calculations for wired groups of nodes for predetermined time periods (intervals). (CL1-L29, CL9-L41-67, Figs. 10-14, especially 11a, 11b, Tab. 3)*

Per dependent claims 4-6, 10-12: This group of claims includes limitations also disclosed by Uchino 966' relating to:

- *dividing the time periods into time blocks (disclosed by Uchino 966' Figs. 10, 11a, 1b, waveforms: Figs. 12a-13b)*
- *calculating elementary waveform probabilities within time periods (disclosed by Uchino 966' CL3-L59, Figs. 10, 11a, 1b, waveforms: Figs. 12a-13b), Clipping the probabilities to a "no higher than predetermined" values would obviously be inherent. (also see Uchino 966' claim 8)*

Allowable Subject Matter

6. *Claims 2, 3, 8, and 9 are dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and assuming the issues relating to 35 USC 101 rejection of the base claims are resolved. (See 101 rejection above)*

Conclusion

7. *The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.*

U.S. Patent 6,324,679 issued to Raghunathan et al teaches power optimization using probabilities in integrated circuits.

U.S. Patent 5,557,531 issued to Rostoker et al teaches IC power estimation using probabilities.

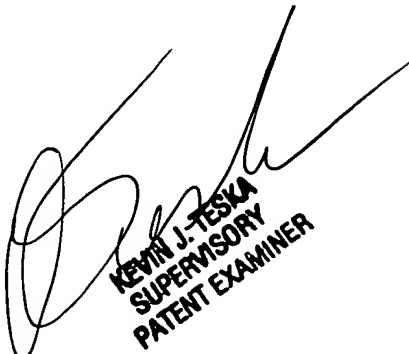
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 703-305-9670 and whose normal working hours are 8:30am to 5:00pm Monday to Friday.

Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 703-305-3900.

The Official Fax Numbers are:

Official (703) 872-9306

Fred Ferris, Patent Examiner
Simulation and Emulation, Art Unit 2128
U.S. Patent and Trademark Office
Crystal Park 2, Room 5D53
Crystal City, Virginia 22202
Phone: (703) 305 - 9670
FAX: (703) 305 - 7240
Fred.Ferris@uspto.gov
May 7, 2004


KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER